Eliminating serogroup A meningococcal meningitis epidemics as a public health problem in Africa

An investment case for the GAVI Alliance

Submitted by the World Health Organization
and United Nations Children's Fund

April 3, 2008

World Health Organization

unicef

Executive Summary

Objective

This GAVI investment case focuses on an integrated program that seeks to rapidly eliminate epidemic serogroup A meningococcal (Nm A) meningitis as a public health problem in sub-Saharan Africa. The proposed activities will also reduce non-epidemic Nm A meningitis and improve the effectiveness of public health response to meningitis epidemics.

The governments of countries in the African Meningitis Belt, public health experts from global health organizations—including the World Health Organization (WHO), UNICEF, the World Bank, the Bill & Melinda Gates Foundation, and the Meningitis Vaccine Project (MVP)—and regional and national institutions are committed to meeting this objective. Working together, these groups have developed the following four-component plan for ending recurring Nm A meningitis epidemics in Africa and improving epidemic response:

- **Preventive conjugate vaccine introduction.** This component involves introducing a meningococcal A conjugate (Men A conjugate) vaccine to immunize a population of approximately 250 million 1- to 29-year-olds and 23 million infants living in up to 25 GAVI-eligible African countries from 2009 to 2015. The effort will protect up to 638 million people through herd immunity that is likely to follow introduction of the Men A conjugate vaccine.
- **Epidemic response.** This component centers on ensuring that adequate quantities of meningococcal polysaccharide (Men Ps) vaccines are available by establishing epidemic-response stockpiles and improving timeliness of response. This initiative is important for two reasons: first, to ensure a smooth transition from current epidemic-response strategies to a preventive approach and, second, to respond to the threat of non-Nm A meningitis outbreaks (C or W_{135}).
- **Case-based surveillance, risk assessment, and Men A conjugate vaccine impact assessment.** This component will strengthen the current enhanced surveillance system of meningitis, establish case-based surveillance, guide the introduction of Men A conjugate vaccine through risk assessment, monitor meningitis epidemiology, and document the impact of this vaccine on epidemic Nm A meningitis.
- **Country-level capacity-building**. This component will ensure that adequate national and regional capacity exist for the implementation of the plan, including preventive conjugate vaccine introduction, epidemic response, and case-based surveillance and risk and impact assessment.

The problem and its proposed solution

Meningitis epidemics exact an enormous toll on the countries located in the African Meningitis Belt. During 1996 and 1997, group A meningococcal epidemics caused more than 250,000 meningitis cases, 25,000 deaths, and residual disabilities (including hearing loss, mental retardation, seizures, and/or paralysis) among 50,000 persons. From 1997 to 2007, 653,400 cases and 59,600 deaths due to meningitis were reported. Although epidemics due to other serogroups (particularly serogroups W_{135} and X) have been documented during

the last decade, approximately 90 percent of meningitis epidemics are due to serogroup A *Neisseria meningitidis.*[1]

The current response to meningitis epidemics consists of reactive mass vaccination campaigns with bivalent (A and C) and/or trivalent Ps vaccine (A, C, and W_{135}) as soon as possible after an epidemic has been declared. Mass immunization campaigns are labor- and cost-intensive. Furthermore, Ps vaccines do not protect very young children, do not protect unvaccinated population groups, and only provide protection for up to three years. As a result, repetitive meningitis outbreak responses deplete countries' scarce health care finances with comparably little impact. A preventive strategy based on conjugate vaccines could have a significantly larger and more enduring impact.

Supplies of WHO-prequalified Ps meningococcal vaccines dropped sharply between 2003 and 2007, such that the available supply is no longer adequate to meet country demand. In the absence of a proactive strategy (e.g., enhanced market incentives), the current situation, where demand outstrips supply, is likely to persist and will create additional shortages in the future.

After consultation with African public health officials, the Meningitis Vaccine Project (MVP), a partnership between the World Health Organization and PATH, has developed an affordable Men A conjugate vaccine. At less than $US 0.50 per dose, the vaccine is safe, immunogenic in both adults and infants, and expected to confer long-term protection. Licensure and WHO prequalification are expected by the end of 2009 for persons one year or older; an infant indication is expected by 2012. Comprehensive introduction of the Men A conjugate vaccine in Meningitis Belt countries is likely to dramatically reduce the circulation of Nm A meningitis and eliminate Nm A epidemics.

During the roll-out phase of Men A conjugate vaccine introduction, Nm A epidemics could still occur in countries that have not yet received the conjugate vaccine, while the threat of Nm C and W_{135} epidemics will continue. A sufficiently large and accessible stockpile of vaccines for epidemic response will ensure protection of at-risk populations and improve epidemic response.

Relevance to GAVI

This project advances the GAVI Alliance's mission to save children's lives and protect people's health by increasing access to immunization in poor countries. Introduction of Men A conjugate vaccine supports GAVI's strategic objectives and milestones in health systems strengthening, uptake of new vaccines, and sustainability of long-term financing. The project also aligns well with GAVI principles, the Global Immunization Vision and Strategies, and the Millennium Development Goals.

The project also supports GAVI's gender policy by:

- Targeting women—the main caregivers of infants and children—with information about the Men A conjugate vaccine introduction.

[1]Greenwood B. Manson Lecture. Meningococcal meningitis in Africa. *Trans R Soc Trop Med Hyg*. 1999;93:341–353.

- Alleviating the disproportionate impact meningococcal disease places on women (e.g., household income loss and caretaking of sick children falls disproportionately on women).
- Ensuring equal vaccine availability during mass campaigns and routine immunization for men and women.

GAVI's support is critical to ensuring that the possibility of rapidly ending Nm A meningitis epidemics becomes a reality. Without the proposed GAVI investment for 2009 through 2015, Meningitis Belt countries will not be able to introduce the new Men A conjugate vaccine. GAVI's support for the creation of an epidemic-response emergency stockpile will guarantee that sufficient quantities of Men Ps vaccines will be available during the transition from epidemic response to a preventive strategy.

At GAVI's inception, a meningococcal conjugate vaccine was considered one of GAVI's priorities for future introduction, along with rotavirus and pneumococcal vaccines. GAVI established Accelerated Development and Introduction Programs (ADIPs) for rotavirus and pneumococcal vaccines, while meningococcal vaccine development was funded through a grant by the Bill & Melinda Gates Foundation to the Meningitis Vaccine Project (MVP). In this context, at the November 2007 GAVI meeting, the GAVI board:

- Reaffirmed the prior board decision to prioritize Men A conjugate vaccine support.
- Agreed that this support should be considered outside of the current vaccine investment strategy process.
- Requested the GAVI Secretariat to initiate the submission and independent review of a meningitis investment case that would be presented to the Board in the spring of 2008.[2]

Relevance to country priorities

The elimination of Nm A meningitis epidemics is a direct response to African countries' request to alleviate one of the region's greatest public health threats.

Expected impact in targeted countries

The plan will eliminate Nm A meningitis epidemics in the most affected 25 African countries that are home to an estimated 95 percent of the world's meningococcal meningitis disease burden. The proposed investment will facilitate introduction of a Men A conjugate vaccine through preventive mass vaccination campaigns and routine immunization strategies, providing long-term direct protection to approximately 272 million people and preventing 149,000 deaths and 347,000 disabilities while saving an estimated $121 million in diagnosis and treatment costs. In addition, the effort is expected to protect an estimated total of 638 million people through the herd immunity likely to be conferred by conjugate vaccines.

Although the precise number of lives saved through improved epidemic response will depend on the number of cases, available evidence suggests that, if the immunization campaign is conducted promptly and thoroughly, up to 70 percent of cases can be

[2]DRAFT Summary Report, GAVI Alliance & Fund Board Meeting, Cape Town, South Africa, 28–29 November 2007.

prevented.[3] As meningitis outbreaks are usually self-limiting after six to seven weeks, outbreak response must be rapid to be of use.

Project cost and financing

The following table summarizes the total cost of the project and the financing over the proposed investment period (2009 through 2015).

Funding source	Amount (US$ millions)
Requested amount of GAVI funding	$370.3
Committed financing from other financiers	$18.5
Expected government financing and community contributions	$182.2
Total	**$571**

3World Health Organization. Meningococcal meningitis. WER 2003; 78 (33): 294-296. Woods CW, Armstrong G, Sackey SO, Tettah C, Bugri S, Perkins BA et al. Emergency vaccination against epidemic meningitis in Ghana: implications for the control of meningococcal disease in West Africa. *The Lancet.* 2000; 355 (9197): 30–33.